The DoD T&E/S&T Program

George Rumford
Program Manager

Test Resource Management Center
Test & Evaluation / Science & Technology Program
(TRMC, T&E/S&T)

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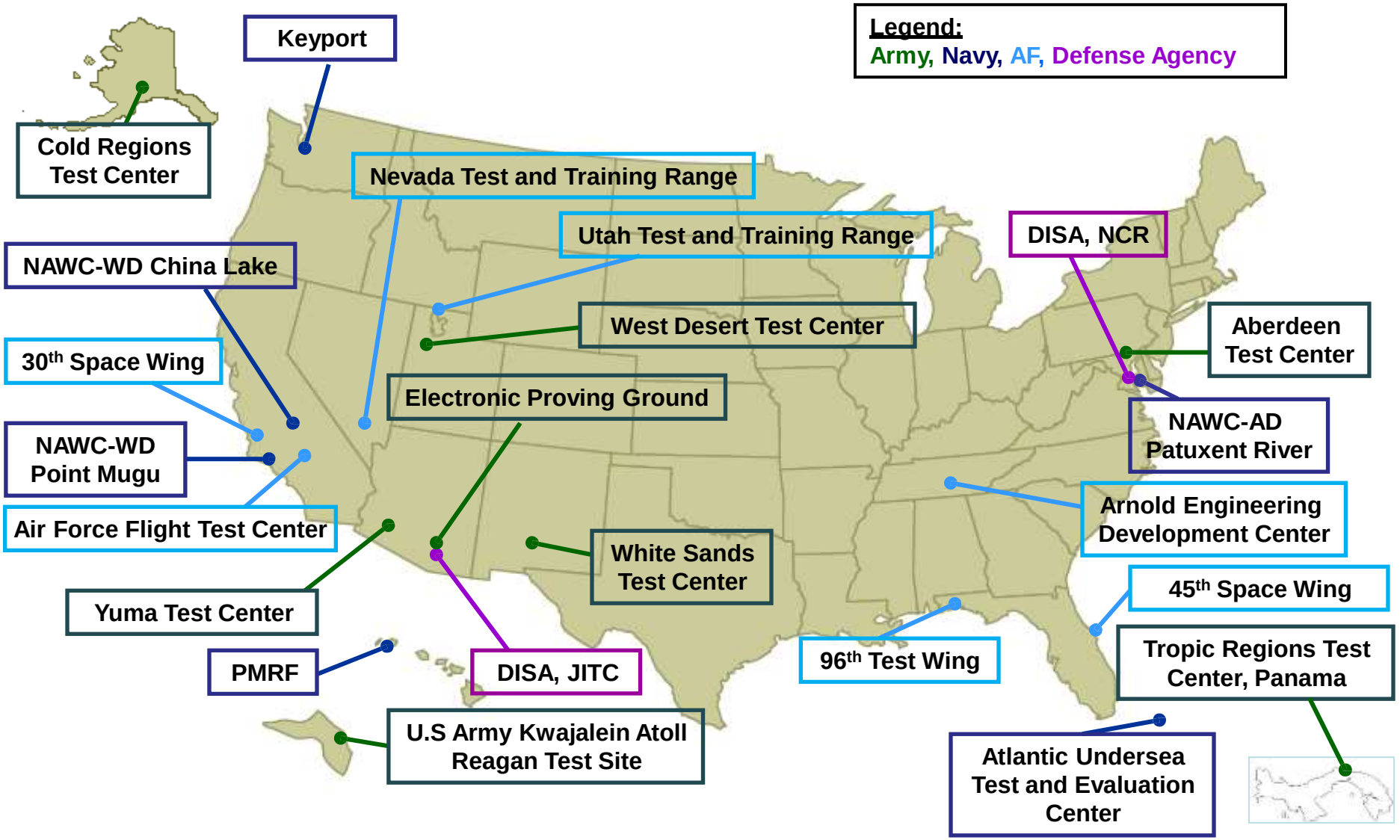
TRMC – STEWARD of the DoD Test Infrastructure

Major Range and Test Facility Base (MRTFB): The "Critical Core"

23 Sites: Army (8); Navy (6); Air Force (7); Defense Agency (2)



TRMC Investment Programs Overview

T&E/S&T

- Established in FY2002
- Develops technologies required to test future warfighting capabilities
- BA 3 RDT&E funds
- ~$95M / year
- 8 Test Technology Areas
  - Electronic Warfare
  - Cyberspace
  - High Speed/Hypersonics
  - Autonomous Systems
  - Net-Centric Systems
  - Directed Energy
  - Advanced Instrumentation
  - Spectrum Efficiencies

Test Technology Development

CTEIP

- Established in FY1991
- Develops or improves test capabilities that have multi-Service utility
- BA 4 RDT&E funds
- ~$150M / year
- 43 current projects
  - 19 projects developing core Joint capabilities
    - 3 projects improving interoperability test cap.
  - 13 projects improving threat representations used in testing
  - 11 projects addressing near-term OT shortfalls

Test Capability Development

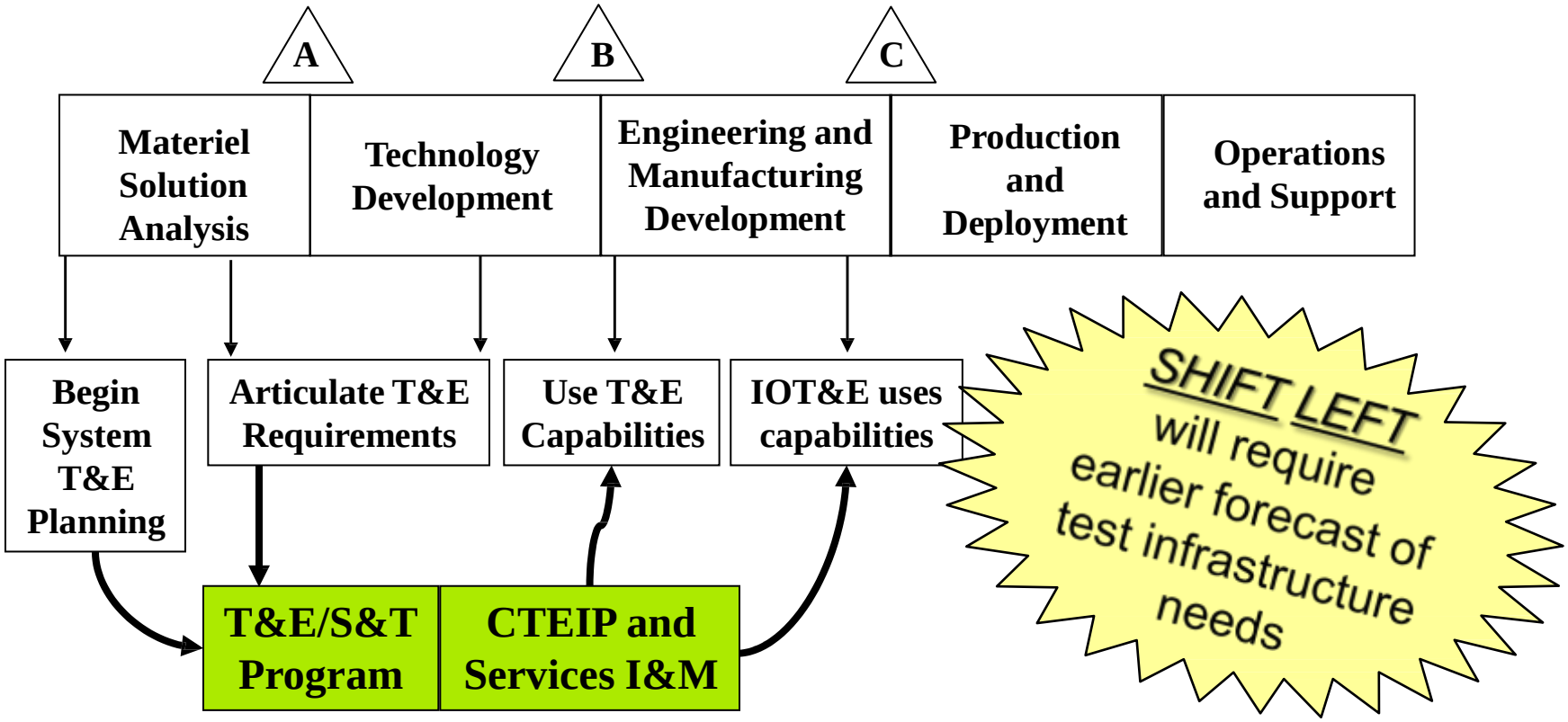
JMETC

- Established in FY2007
- Provides infrastructure for distributed Joint and Cyberspace testing
- BA 5 RDT&E funds
- ~$19M / year
- 73 current sites
  - Expanding to 84 sites
- Maintains
  - Network connections
  - Security agreements
  - Integration software
  - Interface definitions
  - Distributed test tools
  - Reuse repository

Distributed Test Integration

T&E Capability Development Cycle

Challenge: T&E Capabilities must be available in time to provide useful insight to decision-makers and warfighters



Cycle for Test Capability Development Must Begin Early

T&E/S&T Program
Overview

Mission: Develop Technologies Required to Test Future Warfighting Capabilities

- Established in FY02
  - Joint DDR&E / DOT&E Initiative
  - Transitioned to TRMC in FY05
- RDT&E Budget Activity 3 funds
- Purpose
  - High Risk / High Payoff R&D for Testing
  - Foster technology transition to major DoD test ranges
  - Risk reduction for test capabilities developments

85 Active Projects

- Annual Broad Agency Announcements (BAAs)
  - Academia
  - Industry
  - Government Laboratories
- Tri-Service working groups
  - Validate requirements
  - Evaluate proposals
  - Facilitate technology transition
- Central Oversight – Distributed Execution

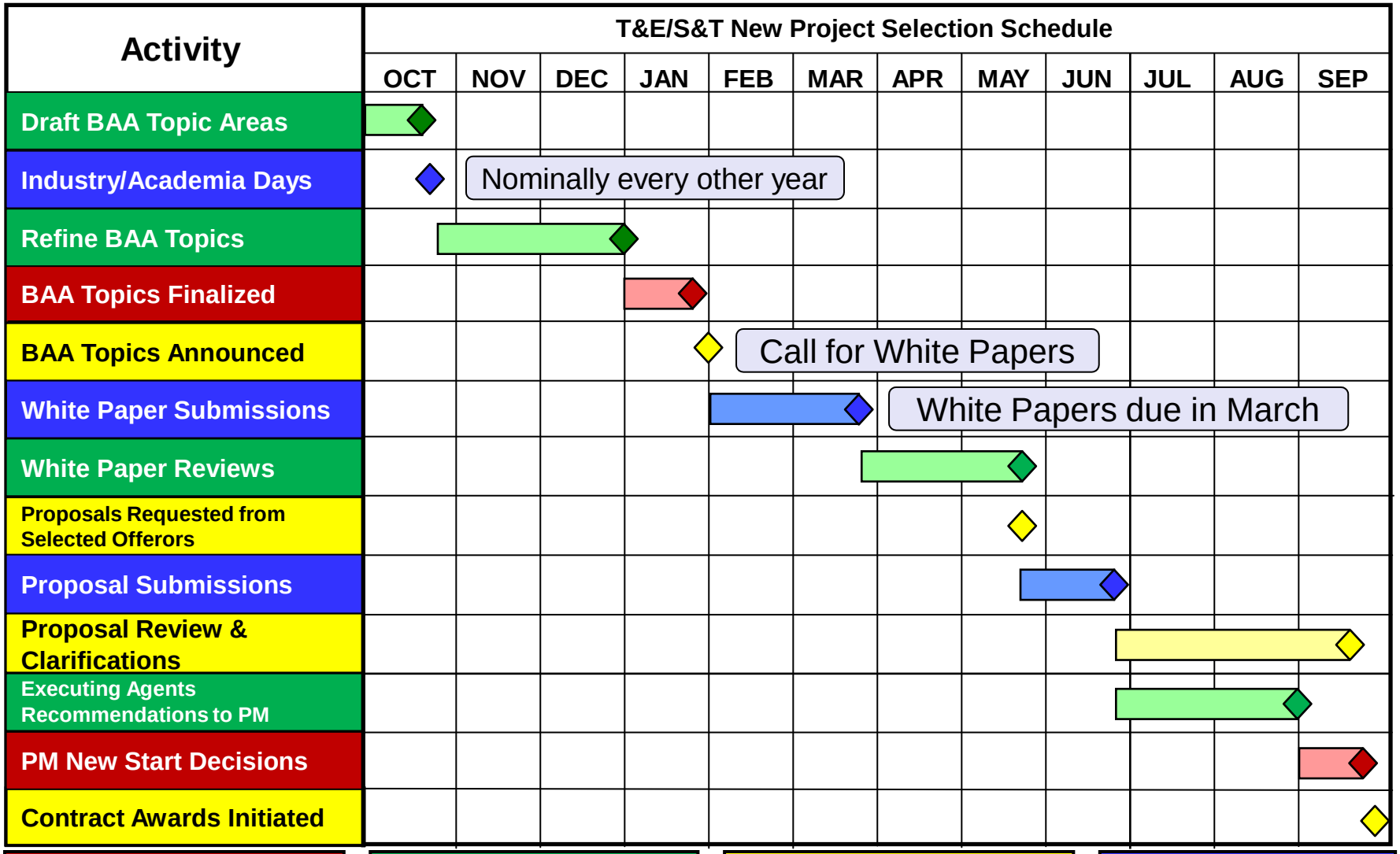
Eight Test Technology Areas

High Speed Systems 13 Active Projects	Unmanned & Autonomous Systems 4 Active Projects	Spectrum Efficiency 13 Active Projects	Advanced Instrumentation 12 Active Projects
Directed Energy 14 Active Projects	Cyberspace 3 Active Projects	Electronic Warfare 18 Active Projects	Net-Centric Systems 8 Active Projects

FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
$96.6M	$92.6M	$92.5M	$94.3M	$97.0M	$98.6M	$100.5M

Shaping Technology into Tomorrow's T&E Capabilities

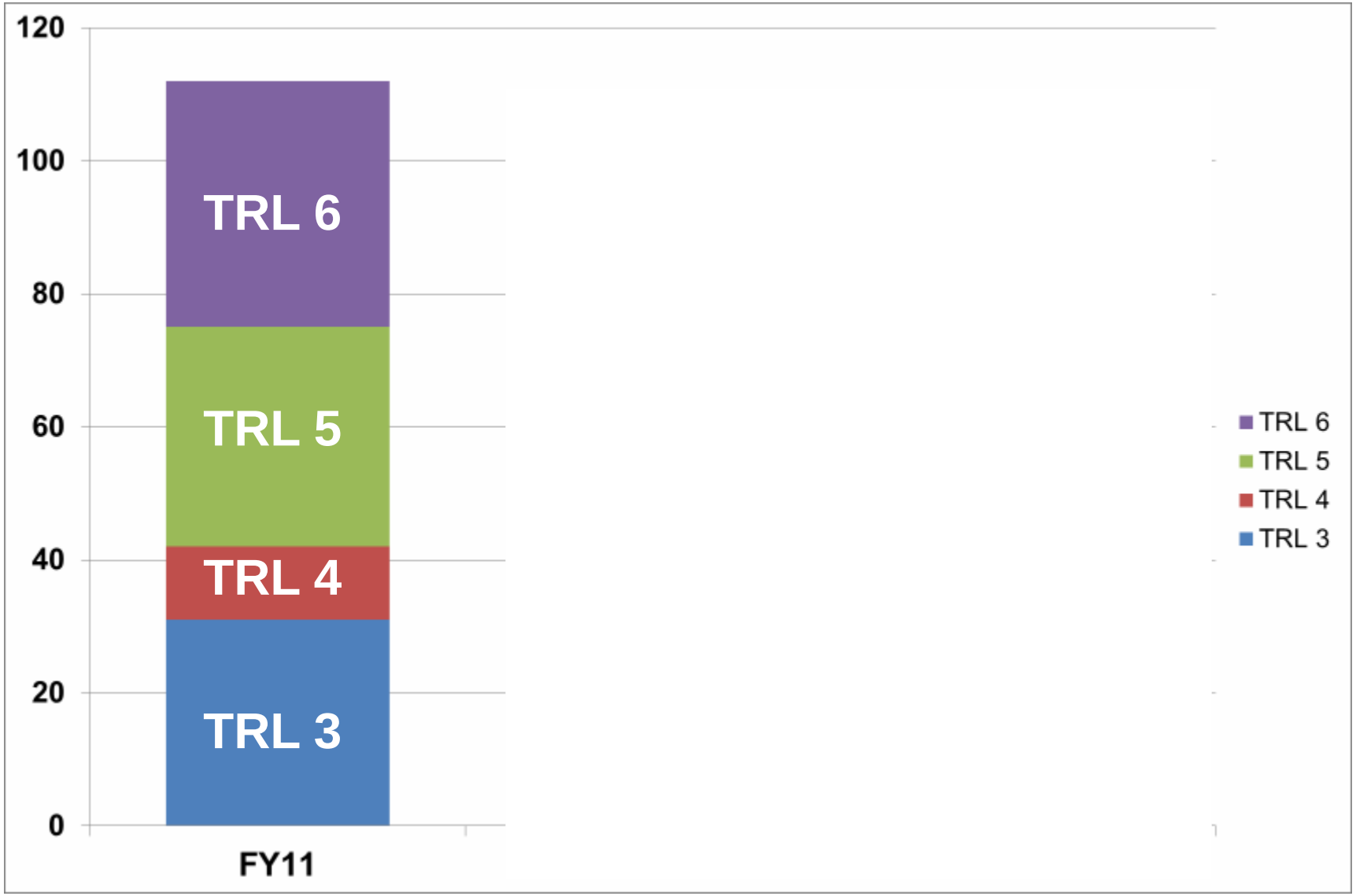
T&E/S&T New Project Selection Schedule



Program Manager Action | Executing Agent Action | Contracting Officer Action | Offeror Action

Project Portfolio Snapshot

Technology Readiness Level by Fiscal Year



T&E/S&T Program

Broad Agency Announcements

- **Topics for Industry, Academia, and Government Laboratories to propose test technology solutions**
- **In-cycle Process**
  - **Declared schedule for white paper submissions (deadline)**
  - **Requires an allocation of available funding**
  - **Priority over out-cycle white papers (must be processed first)**
- **Out-of-cycle Process**
  - **White papers submitted anytime after "in-cycle" deadline**
  - **Offerors "highly encouraged" to contact Executing Agent before submitting white paper**
    - **Ensures interest**
    - **Can address whether a 'chance' exists for funding**
- **All BAAs include an " Other Test Technologies" topic to enable offerors to propose test technology developments that were not previously identified by the Government**

All T&E/S&T BAAs are always open for new white papers

Location of T&E/S&T BAAs

www.fbo.gov

Keyword: TRMC

Note: Change search criteria for "Posted Date" from "Last 90 Days" to "<blank>"

Updated Topics Being Posted by End of May

Out-of-Cycle Only
Must Discuss Concept with Executing Agent Prior to Submittal

T&E/S&T Test Technology Area

Executing Agent Organizations

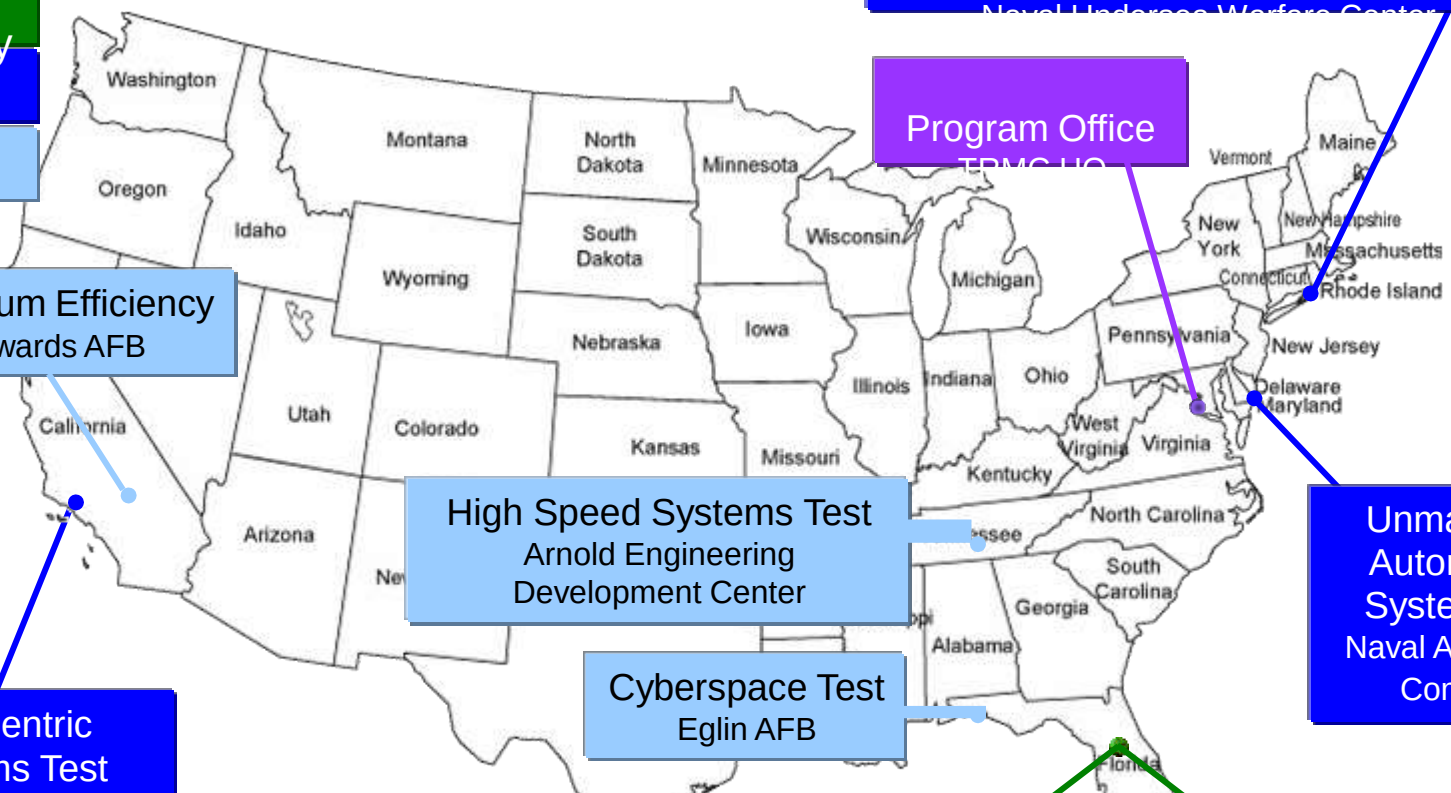
TRMC HQ

Army Navy

Air Force

Advanced Instrumentation Systems

Program Office



Spectrum Efficiency
Edwards AFB

High Speed Systems Test
Arnold Engineering Development Center

Unmanned & Autonomous Systems Test
Naval Air Systems Command

Net-Centric Systems Test
Naval Air Systems Command

Cyberspace Test
Eglin AFB

Directed Energy Test
PEO for Simulation, Training and Instrumentation

Electronic Warfare Test
PEO for Simulation, Training and Instrumentation

Central Oversight – Distributed Execution

Electronic Warfare Test

T&E/S&T Test Technology Area

Executing Agent
Minh Vuong
U.S. Army PEO-STRI
407-384-5238
minh.vuong@us.army.mil

- **Current Portfolio: 18 Projects**
- **FY13 Budget: $20.6M**
- **2 Domains with 15 Current Topics**
  - **Electro Optics: 8 Topics**
  - **Radio Frequency: 7 Topics**
- **Significant Technology Needs**
  - **Full-Range Surrogate Missile Technology**
  - **High-Speed EO/IR Scene Generation**
  - **Missile Body & Plume Attitude Measurement**
  - **Real-time, High-Fidelity, High-Density RF Signal Generation**
  - **Multi-Beam Characterization**
  - **Radar Clutter Simulation**

High Speed Systems Test

T&E/S&T Test Technology Area

Executing Agent
Ed Tucker Arnold Engineering Development Center
931-454-7469
ed.tucker@arnold.af.mil

- **Current Portfolio: 13 Projects**
- **FY13 Budget: $18.2M**
- **5 Domains with 16 Current Topics**
  - **Advanced Propulsion: 6 Topics**
  - **Aerodynamics & Aerothermal: 2 Topics**
  - **Flight Test and Evaluation: 3 Topics**
  - **Computational Tools for Flow Fields: 1 Topic**
  - **Instrumentation for Flow Fields: 4 Topics**
- **Significant Technology Needs**
  - **Propulsion Scaling Test Techniques**
  - **Combined Cycle Propulsion Test Methods**
  - **Hypersonic Flight Erosion Test Methods**
  - **Thermal Protection System Ablation Testing**

Net-Centric Systems Test

T&E/S&T Test Technology Area

Executing Agent
Gil Torres
NAVAIR (Pt. Mugu)
805-989-9521
gilbert.a.torres@navy.mil

- **Current Portfolio: 8 Projects**
- **FY13 Budget: $18.1M**
- **3 Domains with 11 Current Topics**
  - **System of System Testing: 3 Topics**
  - **Improved Test Automation: 3 Topics**
  - **Modeling & Simulation for Test: 5 Topics**
- **Significant Technology Needs**
  - **Flexible Test Harness Generator**
  - **Automated, Rapid, Agile Test Planning**
  - **Removing biases in Distributed Testing**
  - **Rapid Analysis of Voluminous Unstructured Data ("Test Data to Decision")**
  - **Determining Required M&S Fidelity in Tests**

Advanced Instrumentation Systems

T&E/S&T Test Technology Area

Executing Agent
Dr. George Shoemaker
NUWC-Newport
401-832-5304
george.shoemaker@navy.mil

- **Current Portfolio: 12 Projects**
- **FY13 Budget: $9.2M**
- **6 Domains with 24 Current Topics**
  - **Time Space Position Info: 7 Topics**
  - **Advanced Sensors: 9 Topics**
  - **Advanced Energy & Power: 4 Topics**
  - **Non-Intrusive Instrumentation: 2 Topics**
  - **Range Environment Encroachment: 1 Topic**
  - **Human Systems: 1 Topic**
- **Significant Technology Needs**
  - **TSPI without GPS (or with limited GPS)**
  - **Measuring body armor / helmet effectiveness**
  - **Measuring cognitive workload**

Directed Energy Test

T&E/S&T Test Technology Area

Executing Agent
Minh Vuong
U.S. Army PEO-STRI
407-384-5238
minh.vuong@us.army.mil

- **Current Portfolio: 14 Projects**
- **FY13 Budget: $8.8M**
- **3 Domains with 10 Current Topics**
  - **High Power Microwave: 6 Topics**
  - **High Energy Laser: 3 Topics**
  - **Special Interest Area: 1 Topic**
- **Significant Technology Needs**
  - **Neutron Environment Simulator to replicate required nuclear effects test environments**
  - **In Chamber HPM Source**
  - **HPM Electronic Failure Analysis**
  - **Characterizing beam propagation through atmosphere & maximizing laser test windows**

Spectrum Efficient Technology

T&E/S&T Test Technology Area

Executing Agent
Tom Young
Air Force Flight Test Center
(661) 277-1611
tom.young@edwards.af.mil

- **Current Portfolio: 13 Projects**
- **FY13 Budget: $8.7M**
- **3 Domains with 8 Current Topics**
  - **Wireless Technologies: 5 Topics**
  - **Telemetry Networking: 2 Topics**
  - **Spectrum Management: 1 Topics**
- **Significant Technology Needs**
  - **Multiple Access Schemes for Serial Streaming Telemetry**
  - **Modulation Agile Radio for Test Applications**
  - **Channel Estimation and Equalization**
  - **Steerable Multiband Antenna (L-band, S-band, & C-band) for Airborne Test Articles**

Unmanned & Autonomous Systems Test

T&E/S&T Test Technology Area

Executing Agent
Bill Hamel
NAVAIR (Pax River)
301-342-6373
william.hamel@navy.mil

- **Current Portfolio: 4 Projects**
- **FY13 Budget: $5.7M**
- **2 Domains with 7 Current Topics**
  - **Autonomous System Test Planning: 3 Topics**
  - **Autonomous System Performance Assessment: 4 Topics**
- **Significant Technology Needs**
  - **Predicting Autonomous Behavior for Testing**
  - **Enhancing Safety of Autonomous Testing**
  - **Testing of Autonomy Functional Components**
  - **Measure Autonomous System Reliability and Performance**

Cyberspace Test

T&E/S&T Test Technology Area

Executing Agent
Mark Erickson
46 Test Squadron
Eglin AFB FL
850- 882-8106
mark.erickson@eglin.af.mil

- **Current Portfolio: 3 Projects**
- **FY13 Budget: $3.3M**
- **3 Domains with 8 Current Topics**
  - **Cyberspace Test Planning: 3 Topics**
  - **Cyberspace Threats: 2 Topics**
  - **Cyberspace Test Execution/Analysis: 3 Topics**
- **Significant Technology Needs**
  - **Cyberspace test visualization**
  - **Defining cyberspace test measurements**
  - **Improved, scalable cyberspace threat representations**
  - **Advanced cyberspace instrumentation**
  - **Improved cyberspace analysis**

The Proposal — Key Criteria

- **Meets a T&E Need**
- **Requires S&T work**
- **High Payoff**
- **Broad application (more than one DoD test activity)**
- **High potential for transition to development of a test capability**

T&E/S&T Program
Summary

- **T&E/S&T Program initiated to address critical T&E needs tied to S&T drivers**
  - Advancing the state of the art in T&E technologies
- **The only DoD S&T program dedicated to T&E**
- **Annual Call to Industry, Academia, and Government Laboratories to address test capability needs**
- **Competitive technology developments to get the best technologies possible to the test community**
- **Focused on transition into needed test capabilities**

Looking Ahead, Responsive, and Agile

Questions?

Contact Information:

Mr. George Rumford

Test Resource Management Center
T&E / S&T Program

George.Rumford@osd.mil